CLAIMS

What is claimed is:

1. A semiconductor bridge (SCB) device, comprising:

a laminate layer on top of an insulating material, wherein the laminate layer comprises a series of layers of at least two reactive materials, and wherein the laminate layer comprises,

two relatively large sections that substantially cover the surface area of the insulating material; and

a bridge section joining the two relatively large sections;

at least one conductive contact pad coupled to at least one of the series of layers, wherein a predetermined current through the at least one conductive contact pad causes the bridge section to initiate a reaction in which the laminate layer is involved.

2. The SCB device of claim 1, where the at least two reactive materials comprise a reactive metal and a reactive insulator, wherein the reactive insulator has a resistivity that is high relative to a resistivity of the reactive metal, and wherein the reactive metal is in contact with the at least one conductive contact pad.

3. The SCB device of claim 2, wherein the reactive metal is titanium and wherein the reactive insulator is boron.

4. The SCB device of claim 1, wherein each layer of the series of layers is approximately 0.25 microns thick.

5. The SCB device of claim 4, wherein the series of layers has a thickness of between two microns and fourteen microns.

6. The SCB device of claim 1, further comprising an integrated diode formed by an interface of the insulating material with another material.

7. The SCB device of claim 1, wherein the at least one conductive contact pad comprises titanium/nickel/gold.

8. An electro-explosive device (EED), comprising:

a header;

a cap coupled to a first side of the header to form an enclosure;

ordnance material inside the enclosure;

at least one electrically conductive pin that passes through a second side of the enclosure opposite the first side; and

a semiconductor bridge (SCB) on a substrate, wherein the substrate is coupled to the first side of the header, the SCB comprising a series of layers of at least two reactive materials on top of the substrate, wherein the series of layers comprises,

two relatively large sections that substantially cover the surface area of the substrate; and

a bridge section joining the two relatively large sections;

at least one conductive contact pad coupled to at least one layer of the series of layers and to the at least one electrically conductive pin, wherein a predetermined current through the at least one electrically conductive pin causes the bridge section to initiate a reaction in which the series of layers is involved, igniting the ordnance material.

9. The EED of claim 8, where the at least two reactive materials comprise a reactive metal and a reactive insulator, wherein the reactive insulator has a resistivity that is high relative to a resistivity of the reactive metal, and wherein the reactive metal is coupled to the at least one electrically conductive pin.

10. The EED of claim 9, wherein the reactive metal is titanium and wherein the reactive insulator is boron.

11. The EED of claim 8, wherein each layer of the series of layers is approximately 0.25 microns thick.

12. The EED of claim 11, wherein the series of layers has a thickness of between two microns and fourteen microns.

13. A semiconductor bridge (SCB), comprising:

a layer of electrically insulating material substantially covering a surface area of a substrate;

at least one integrated diode comprising an interface of the electrically insulating material and another material;

a bridge layer of a reactive material on top of the layer of electrically insulating material, wherein the bridge layer comprises,

two relatively large sections that substantially cover the surface area of the substrate; and

a bridge section joining the two relatively large sections;

a laminate layer comprising a series of layers of at least two reactive materials, wherein the laminate layer covers a surface area of the bridge section; and

at least one conductive contact pad coupled to the bridge section, wherein a predetermined current through the at least one conductive contact pad causes a reaction in which the laminate layer and the bridge layer are involved.

14. The SCB of claim 13, wherein the bridge layer comprises titanium.

15. The SCB of claim 13, wherein the bridge layer comprises palladium.

16. The SCB of claim 13, where the at least two reactive materials comprise a reactive metal and a reactive insulator, wherein the reactive insulator has a resistivity that is high relative to a resistivity of the reactive metal.

17. The SCB of claim 16, wherein the reactive metal is titanium and wherein the reactive insulator is boron.

18. The SCB of claim 13, wherein each layer of the series of layers is approximately 0.25 microns thick.

19. The SCB of claim 18, wherein the laminate layer has a thickness of between two microns and fourteen microns.

20. The SCB of claim 13, wherein the metal comprising the other material is aluminum.

21. The SCB of claim 13, wherein the at least one conductive contact pad comprises titanium/nickel/gold.

22. A method of fabricating a semiconductor bridge SCB device, comprising:

depositing a layer of electrically insulating material over a surface area of a substrate so as to substantially cover a surface area of the substrate;

selectively etching the electrically insulating material to expose the substrate;

depositing a metal in areas exposed by the etching so as to form at least one diode;

depositing a series of layers of at least two reactive materials on top of the insulating layer, wherein the series of layers comprises,

two relatively large sections that substantially cover the surface area of the substrate; and

a bridge section joining the two relatively large sections;

coupling at least one conductive contact pad to at least one layer of the series of layers, wherein a predetermined current through the at least one conductive contact pad causes the bridge section to initiate a reaction in which the series of layers is involved.

23. The method of claim 22, where the at least two reactive materials comprise a reactive metal and a reactive insulator, wherein the reactive insulator has a resistivity that is high relative to a resistivity of the reactive metal, and wherein the reactive metal is in contact with the at least one conductive contact pad.

24. The method of claim 23, wherein the reactive metal is titanium and wherein the reactive insulator is boron.

25. The method of claim 22, wherein each layer of the series of layers is approximately 0.25 microns thick.

26. The method of claim 25, wherein the series of layers has a thickness of between two microns and fourteen microns.

27. The method of claim 22, wherein the metal is aluminum.

28. The method of claim 22, wherein the at least one conductive contact pad comprises titanium/nickel/gold.